

Reverse Engineering

Subject/Course: Computer Aided Drafting

Grade (s): 9-12 Designer (s)

Stage 1: Desired Results

Core Standard(s):

Create multi-view and orthographic projections of isometric objects

Understandings: Students will understand that....

Projected views of various objects to increase visualization skills Line types and the proper uses.

Essential Question(s):

What are hidden lines and where do I put them?

What views do I draw and need for each object?

Where do I put the dimensions?

Students will know....

Student will be able to

The alphabet of lines

How to use and understand line weights

Dimensioning techniques

Develop plans that could be used as blueprints for a project.

Stage 2: Assessment Evidence

What evidence will show that students understand?

x	Performance Task	x	Project	Quizzes
x	Tests	x	Informal Observations	Discussions
	Interviews		Self-Assessment	Other

Goal – Enhance an existing product through designing strategies and techniques

Role – You (or a team) are the engineer(s) in a machining company.

Audience - Your employer

Situation – You are working against other employees (teams) to receive a bonus

Product Performance – You need to design a better plan for an existing or defective product. The product may work, but is ineffective or cumbersome.

Standard for success - Your proposal should:

- Provide a written step by step process for development
- Include criteria which explains the changes proposed
- Show complete drawings used for the development of the new product

Stage 3: Learning Plan

Motivation – Introduce and Explain

How will you help students know *where* they are headed and why? How will you *hook* students through engaging and thought-provoking experiences that point toward big ideas, essential questions, and performance tasks?

Students will understand the final goal to be reached by observing the faulty product. It is best to demonstrate how the product works and the reason for change. They can research sample products using internet search engines for examples.

Model (Teacher presentation):

What instruction is needed to *equip* students for final performance?

The class should have a visual example given of a similar project.

They can also research the stages for reverse engineering.

Free hand sketches may help to get them started before putting it on the computer.

Encourage free thinking and out of the box ideas.

Guided and Independent Practice (Student Engagement):

What events can students *experience* to make the ideas and issues real? What learning activities will help student to *explore* the big ideas and essential questions?

Have a guest speaker discuss engineering issues that they face on a daily basis.

Tour an engineering department of any company.

Interview a professional in the field and report to the group the findings.

Reflection/Assessment:

How will you cause students to *reflect* and *rethink* to dig deeper into core ideas? How will you guide students in *rehearsing*, *revising*, and *refining* their work based on feedback and self-assessment? How will students *exhibit* their understanding about their final performances and products? How will you guide them in *self-evaluation* to identify the strengths and weaknesses in their work and set future goals?

They must report to you (the employer) daily. Have them explain their ideas and report the progress.

Have a group discussion in the end, and justify their ideas.

They can give an oral report to the rest of the class, and allow feedback from classmates.